Intel® Server Board STL2 Product Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies/Products

Order Number: A28570-001

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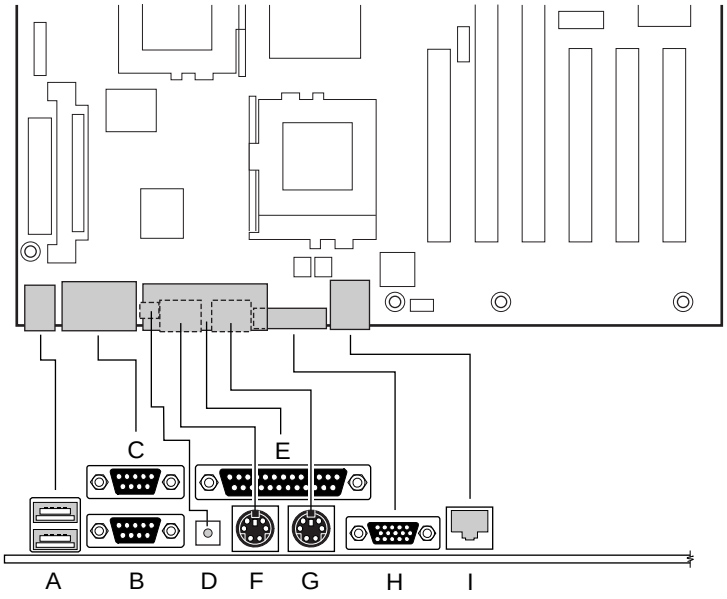
1 Description

Server Board Features

Table 1. Server Board Features

Feature	Description
Processor	Up to two Intel® Pentium® III processors in a Flip Chip Pin Grid Array (FC-PGA) package.
Memory (DRAM)	Four 72 bit sockets for 168-pin, gold contact, 133 MHz, 3.3V, PC/133 compliant, registered, ECC, SDRAM dual inline memory modules (DIMM).
Video Memory	4 MB of video memory.
PCI bus	Four standard PCI (PCI-33/32 bit) expansion slots for add-in boards. Two PCI-66 MHz/64 bit expansion slots.
Graphics	Integrated onboard ATI Rage IIC 64 bit SVGA controller.
SCSI	Adaptec† AIC- AIC7899, supporting onboard Ultra2 (LVD) wide and Ultra-wide SCSI interfaces.
Network	Integrated onboard NIC, an Intel® 82559 single chip PCI LAN controller for 10 or 100 Mbps TX Fast Ethernet networks. RJ-45 Ethernet connector at I/O back panel.
System I/O	PS/2†-compatible keyboard and mouse ports, 6 pin DIN. Advanced parallel port, supporting Enhanced Parallel Port (EPP) level 1.7 and 1.9, ECP, compatible 25 pin. VGA video port, 15 pin. Two serial ports, 9 pin. RJ-45 Ethernet port. Two USB ports.
Form Factor	Server ATX form factor, ATX 2.01 compliant I/O.

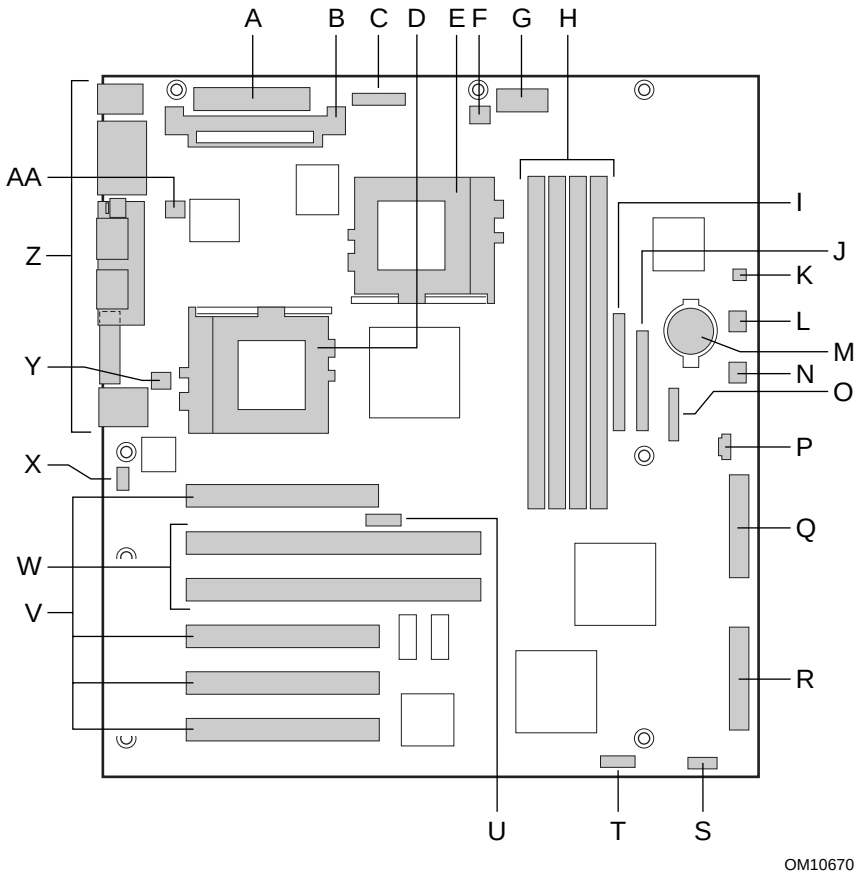
Back Panel Connectors



A. USB connectors
B. Serial port 2 connector
C. Serial port 1 connector
D. NMI switch
E. Parallel port connector
F. Keyboard connector
G. Mouse connector
H. Video connector
I. Network connector

Figure 1. Back Panel Connectors

Server Board Connector and Component Locations



A. Main power connector (P33)
B. VRM socket (P32)
C. Auxiliary power connector (P34)
D. Primary processor (P13)
E. Secondary processor (P14)
F. Secondary processor heatsink fan connector (P36)
G. Power supply signal connector (P37)
H. DIMM slots (P15-P18)
I. IDE connector (P19)
J. Floppy drive connector (P20)
K. Two pin speaker connector (P31)
L. System fan connector FAN3A (P29)
M. Battery
N. System fan connector FAN2A (P27)
O. Front panel connector(P23)
P. Four pin speaker connector (P25)
Q. Ultra Single Ended (SE) SCSI connector (P9)
R. Ultra160 LVD SCSI connector (P8)
S. Configuration jumper block (1L4)
T. Configuration jumper block (1J15)
U. CPU speed jumper block (5E1)
V. 33 MHz/32-bit PCI connectors
W. 66 MHz/64-bit PCI connectors
X. Chassis intrusion connector (pins 1-2 of 6A)
Y. System fan connector FAN1 (P11)
Z. I/O ports
AA. Primary processor heatsink fan connector (P12)

Figure 2. Server Board Connector and Component Locations

Processor

The STL2 server board accommodates one or two Intel Pentium III processors for the PGA370 socket. This processor uses the same core and offers the same performance as the Intel Pentium III processor for the slot 2 connector, but utilizes a new package technology called flip chip pin grid array, or FC-PGA. The processor external interface operates at a maximum of 133 MHz.

Memory

The system board contains four 168-pin DIMM sockets. Memory is partitioned as four banks of registered SDRAM DIMMs (PC133 compatible), each providing 72 bits of noninterleaved memory (64-bit main memory plus ECC).

Memory should be added in order from slot 1 to slot 4.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

NOTE

Use DIMMs that have been tested for compatibility with the server board. Contact your sales representative or dealer for a current list of approved memory modules. Check the Intel Customer Support website for the latest tested memory list:

http://support.intel.com/support/motherboards/server/STL2/compat.htm

Add-in Board Slots

The server board has three full length and one half length standard PCI (PCI-33/32 bit) connectors. PCI features:

- Bus speed up to 33 MHz
- 32 bit memory addressing
- 5 V signaling environment
- Burst transfers of up to 133 Mbps
- 8, 16, or 32 bit data transfers
- Plug and Play ready
- Parity enabled

The server board has two full length PCI-66/64 bit. PCI features:

- Bus speed up to 66 MHz
- 32 bit memory addressing
- 5 V/3.3 V signaling environment
- Burst transfers of up to 528 Mbps
- 8, 16, 32, or 64 bit data transfers
- Plug and Play ready
- Parity enabled

NOTE

If you install a PCI-33 card into one of the PCI-66 slots, the bus speed for all three slots will be lowered to 33 MHz.

Video

The system has an integrated ATI Rage IIC 64 bit high-performance SVGA subsystem that supports the following:

- BIOS compatibility with VGA, EGA, CGA, Hercules Graphics, and MDA
- 4 MB of 10 ns onboard Synchronous Graphics Memory (SGRAM)
- Pixel resolutions up to 1280 X 1024
- Analog VGA monitors (single and multiple frequency, interlaced and noninterlaced) with a maximum vertical retrace noninterlaced frequency of 100 Hz.

SCSI Controller

The embedded Adaptec AIC-7899 dual function SCSI controller provides both Ultra160 (LVDS) and Ultra wide (SE) SCSI interfaces as two independent PCI functions.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the end of the cable must be terminated. LVDS devices generally do not have termination capabilities. Non-LVDS devices generally are terminated through a jumper or resistor pack.

IDE Controller

The system includes a single channel enhanced IDE 32 bit interface controller for intelligent disk drives with disk controller electronics onboard. The controller has a connector located on the system board that supports a master and a slave device.

The device controls:

- PIO and DMA transfer modes
- DMA-33 capable
- Mode 4 timings
- Transfer rates up to 33 MB/s
- Buffering for PCI/IDE burst transfers
- Master/slave IDE mode
- Up to two devices.

Network Controller

NOTE

To ensure EMC product regulation compliance, the end system must be used with a shielded LAN cable.

The server board includes a 10BASE-T/100BASE-TX network solution based on the Intel 82559 single chip Fast Ethernet PCI Bus Controller. As a PCI bus master, the controller can burst data at up to 132 MB/s. The controller contains two receive and transmit FIFO buffers that prevent data overruns or underruns while waiting for access to the PCI bus. The controller has the following:

- 32 bit PCI bus master interface (direct drive of bus), compatible with *PCI Bus Specification*, Revision 2.1
- Chained memory structure with improved dynamic transmit chaining for enhanced performance
- Programmable transmit threshold for improved bus utilization
- Early receive interrupt for concurrent processing of receive data
- Onchip counters for network management
- Autodetect and autoswitching for 10 or 100 Mbps network speeds
- Support for both 10 Mbps and 100 Mbps networks, capable of full or half duplex, with back-to-back transmit at 100 Mbps

Network Teaming Features

The network controller provides several options for increasing throughput and fault tolerance when running Windows NT† 4.0, Windows† 2000 or NetWare† 4.1x or newer:

- Adapter Fault Tolerance (AFT) - provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over. AFT works with any hub or switch.
- Adaptive Load Balancing (ALB) - creates a team of 2 - 4 adapters to increase transmission throughput. Also includes AFT. Works with any 10Base-TX or 100Base-TX switch.
- Fast EtherChannel† (FEC) - creates a team of 2, 3 or 4 adapters to increase transmission and reception throughput. Also includes AFT. Requires an FEC-enabled switch.

To set up an option, read the instructions in the Windows NT 4.0 or NetWare 4.1x readme files.

General Configuration Notes

1. Windows NT versions prior to 4.0 don't support Adapter Teaming options.
2. Adapter Teaming options require NT 4.0 with Service Pack 4.0 or Service Pack 3.0 and Hotfix.
3. In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Adapter Fault Tolerance

Adapter Fault Tolerance (AFT) is a simple, effective, and fail-safe approach to increase the reliability of server connections. AFT gives you the ability to set up link recovery to the server adapter in case of a cable, port, or network interface card failure. By assigning two PRO/100 Intelligent Server adapters as a team, AFT enables you to maintain uninterrupted network performance.

AFT is implemented with two PRO/100 Intelligent Server adapters: a primary adapter and a backup, or secondary, adapter. During normal operation, the backup will have transmit disabled. If the link to the primary adapter fails, the link to the backup adapter automatically takes over.

Preferred Primary Adapter

With multiple adapters installed, you can specify one as the Preferred Primary adapter. For example if you have a server with a PRO/100 Intelligent Server adapter as the primary adapter and a PRO/100+ adapter as the secondary, you would want the PRO/100 Intelligent Server adapter to be the preferred primary. In this scenario, if the PRO/100 Intelligent Server adapter fails, the PRO/100+ will take over. Then when the PRO/100 Intelligent Server adapter is replaced, it will automatically revert to being the primary adapter in the team.

If a Preferred Primary is not selected, PROSet will attempt to select the best adapter, based on adapter model and speed.

Mixed Adapter Teaming

AFT supports up to four PRO/1000 or PRO/100 adapters per team, in any mix.

Adaptive Load Balancing

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your server's transmit throughput. With ALB you group PRO/100 Intelligent Server adapters in teams to provide an increased transmit rate (up to 400 Mbps) using a maximum of four adapters. The ALB software continuously analyzes transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps.

To use ALB, you must have two, three, or four PRO/100 Intelligent Server adapters installed in your server or workstation and linked to the same network switch.

Cisco Fast EtherChannel

Fast EtherChannel (FEC) is a performance technology developed by Cisco to increase your server's throughput. Unlike ALB, FEC can be configured to increase both transmission and reception channels between your server and switch. FEC works only with FEC-enabled switches, such as the Catalyst 5000 series. With FEC, as you add adapters to your server, you can group them in teams to provide up to 800 Mpbs at full duplex, with a maximum of four PRO/100 Intelligent Server adapters. The FEC software continuously analyzes loading on each adapter and balances network traffic across the adapters as needed. Adapter teams configured for FEC also provide the benefits of AFT.

To use FEC, you must have two or four PRO/100 Intelligent Server adapters installed in your server and linked to the same FEC-enabled Cisco switch.

Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. The server may be locked automatically if there is no keyboard or mouse activity for a predefined length of time, if specified through the System Setup Utility (SSU). Once the inactivity (lockout) timer has expired, the keyboard and mouse do not respond until the previously stored password is entered.

ACPI

The STL2 supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 1.0 and PC97 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fan and processor fans will still run.

The STL2 supports sleep states s0, s1, s4, and s5. With future versions of Microsoft Windows 9X that support ACPI, the BIOS will only support sleep states s0, s1, and s5. With future versions of Microsoft Windows NTx that support ACPI, the BIOS will support sleep states s0, s1, s4, and s5.

- s0: Normal running state.
- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off: Only the RTC section of the PIIX4 and the BMC are running in this state.

⚠ CAUTION

The system is off only when the AC power is disconnected.

Security

To help prevent unauthorized entry or use of the server, Intel® Server Control server management software monitors the system intrusion switch.

Security with Mechanical Locks and Monitoring

If installed, you can activate the chassis intrusion alarm switch. When the side door is opened, the switch transmits an alarm signal to the server board, where BMC firmware and server management software process the signal. The system can be programmed to respond to an intrusion by powering down or by locking the keyboard, for example.

Software Locks

The BIOS Setup and the System Setup Utility (SSU) provide a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period—1 to 120 minutes.
- Set and enable an supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

Using Passwords

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup or the SSU.
- Must enter the user password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.
- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup or the SSU.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup or the SSU. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup or the SSU and have access to all of the options.

- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.
- May enter either password to exit secure mode.

Secure Mode

Configure and enable the secure boot mode by using the SSU. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via the Server Manager Module or power control via the real time clock.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the SSU and go to the Security Subsystem Group, menu. The table also refers to other SSU menus and to the Setup utility.

Table 2. Software Security Features

Feature	Description
Secure mode	**How to enter secure mode:** • Setting and enabling passwords automatically places the system in secure mode. • If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period. When the system is in secure mode: The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered. At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode. If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time. To leave secure mode: Enter the correct password(s).
Disable writing to diskette	In secure mode, the server will not boot from or write to a diskette unless a password is entered. To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.

continued

Table 2. Software Security Features (continued)

Feature	Description
Set a time out period so that keyboard and mouse input are not accepted Also, screen can be blanked, and writes to diskette can be inhibited	Specify and enable an inactivity time out period of from 1 to 120 minutes. If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted. The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup). To resume activity: Enter the correct password(s).
Control access to using the SSU: set supervisor password	To control access to setting or changing the system configuration, set an supervisor password and enable it through Setup. If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed. To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 5).
Control access to the system other than SSU: set user password	To control access to using the system, set a user password and enable it through Setup. To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the User Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 5).
Boot without keyboard	The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.
Specify the boot sequence	The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the “Secure Boot Mode” option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.

2 Upgrading

Tools and Supplies Needed

- Phillips (cross head) screwdriver (#1 bit and #2 bit)
- Jumper removal tool or needle nosed pliers
- Pen or pencil
- Antistatic wrist strap and conductive foam pad (recommended)

Cautions

These warnings and cautions apply throughout this chapter. Only a technically qualified person should configure the server board.

⚠ CAUTIONS

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices & cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) & ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground—any unpainted metal surface—on your server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the

jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the stake pins on the board.

Memory

Only PC133-compliant SDRAM is supported by the server board. Install from 64 MB to 4 GB of registered memory, using up to four single- or double-banked DIMMs.

DIMMs must be installed in order from slot 1 to slot 4, no empty slots between installed DIMMs. Slot 1 is the slot farthest from the processors.

Installed DIMMs must be the same speed and must all be registered. For a list of supported memory, call your service representative or visit the Intel Support website:

http://support.intel.com/support/motherboards/server/STL2/compat.htm

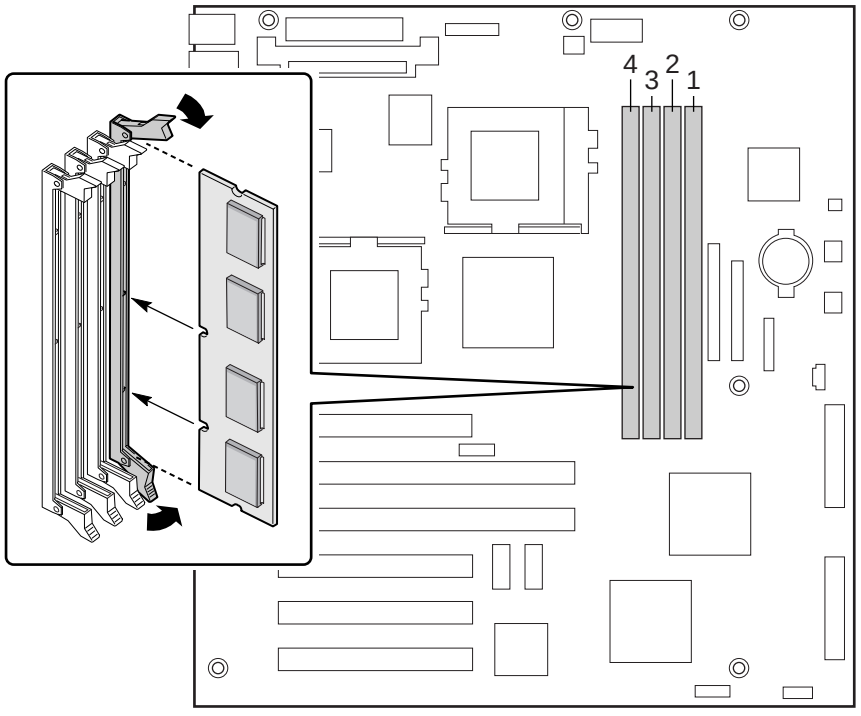


Figure 3. Installing DIMMs

Processors

WARNING

If the server has been running, any installed processor and heat sink on the processor board(s) will be hot. To avoid the possibility of a burn, be careful when removing or installing server board components that are located near processors.

CAUTIONS

Processor must be appropriate: You may damage the server if you install a processor that is inappropriate for your server. Make sure your server can handle a newer, faster processor (thermal and power considerations). For exact information about processor interchangeability, contact your customer service representative or visit the Intel Customer Support website:

http://support.intel.com/support/motherboards/server/STL2

ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

Adding or Replacing a Processor

If you are adding a second processor to your system, you must first remove the terminator from the secondary processor socket. The second processor must be compatible with the first processor (within one stepping, same voltage, same speed, see the Intel support website for specifics).

1. Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here.
2. Remove the side cover (see your system or chassis documentation for instructions).
3. Raise the locking bar on the socket.

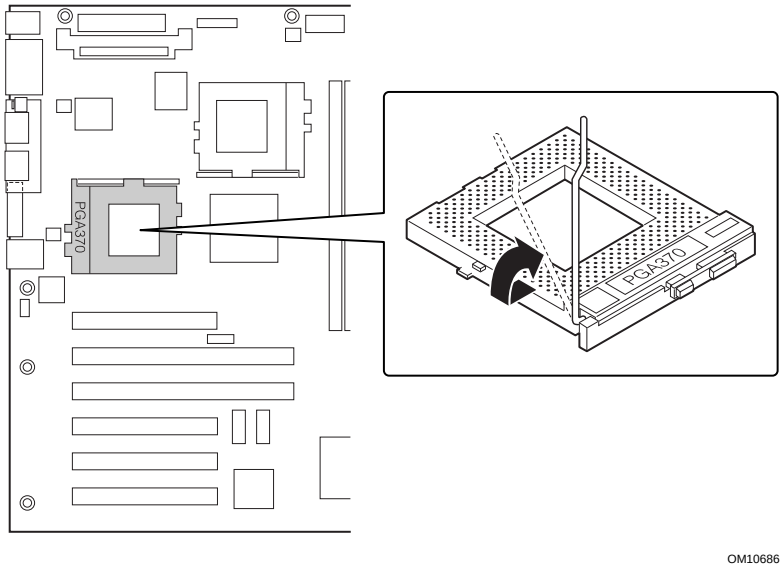


Figure 4. Raise the Locking Bar

4. Aligning the pins of the processor with the socket, insert the processor into the socket. Note what the processor speed is so you can set the jumpers correctly.

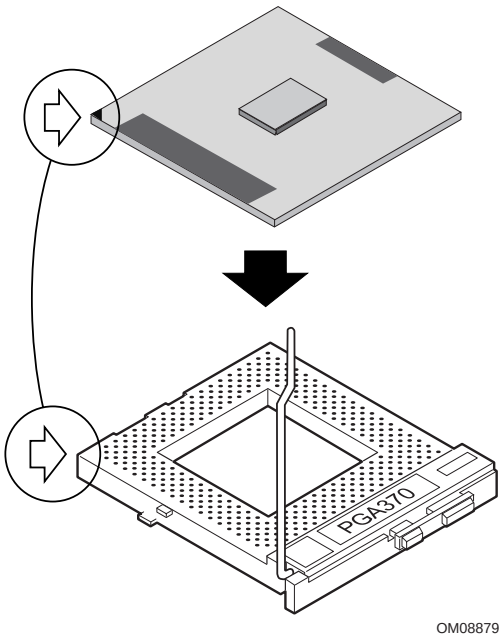


Figure 5. Insert the Processor

5. Lower the locking bar completely.

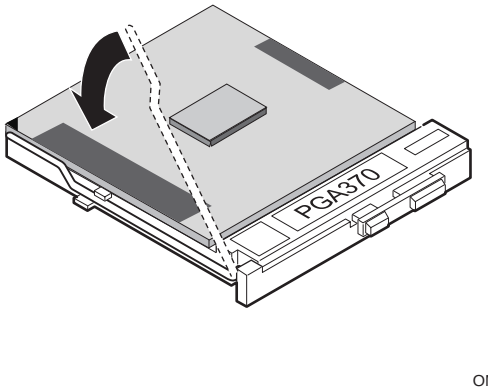


Figure 6. Lower the Locking Bar

6. Place the fan heatsink on top of the processor.

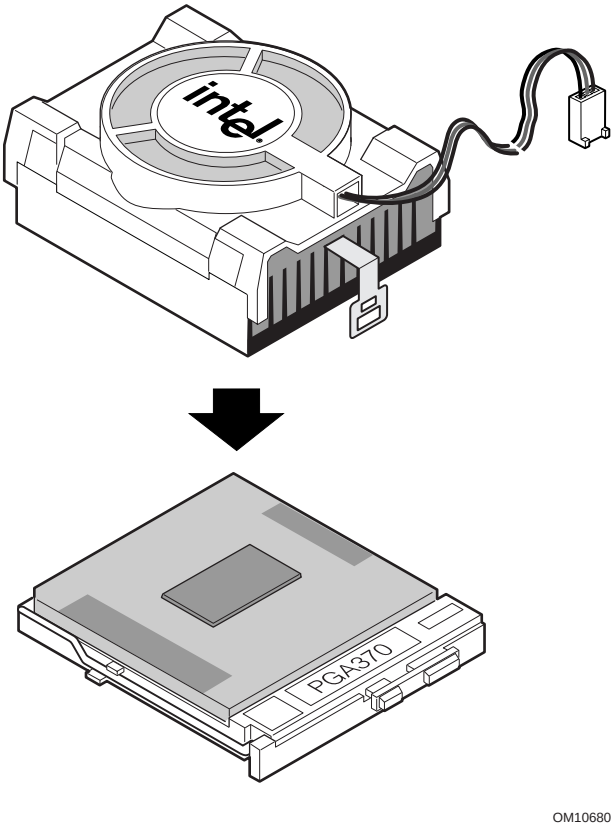


Figure 7. Place the Heatsink

7. Attach the fan heatsink clip to the processor socket. We recommend attaching the side away from the fan cable first. Then use a screw driver or other tool to attach the remaining side.

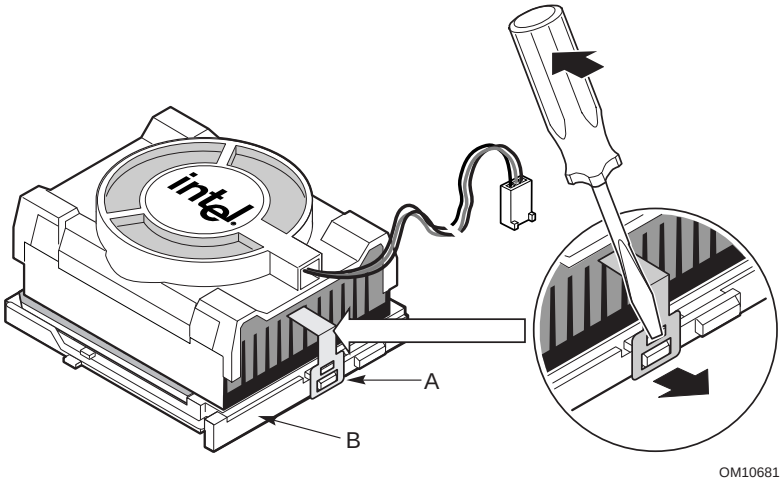


Figure 8. Attach the Heatsink

8. Connect the processor fan cable to the processor fan connector.

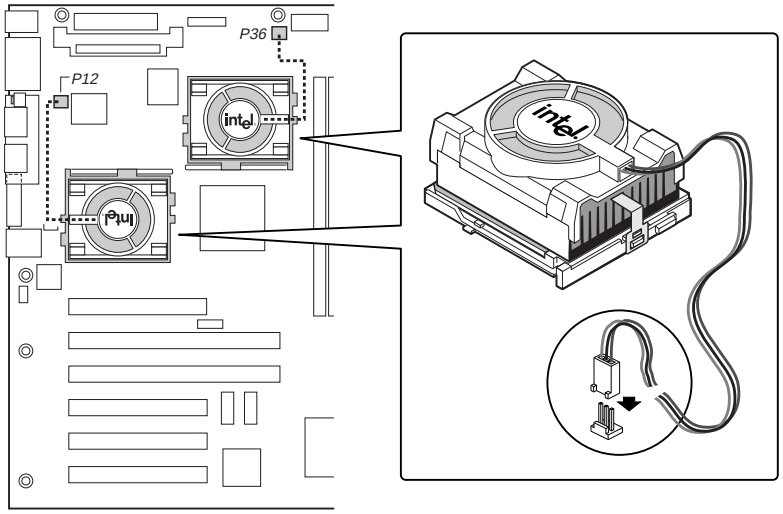


Figure 9. Connect the Processor Fan

9. If you are installing faster processors, you must configure the speed jumpers.

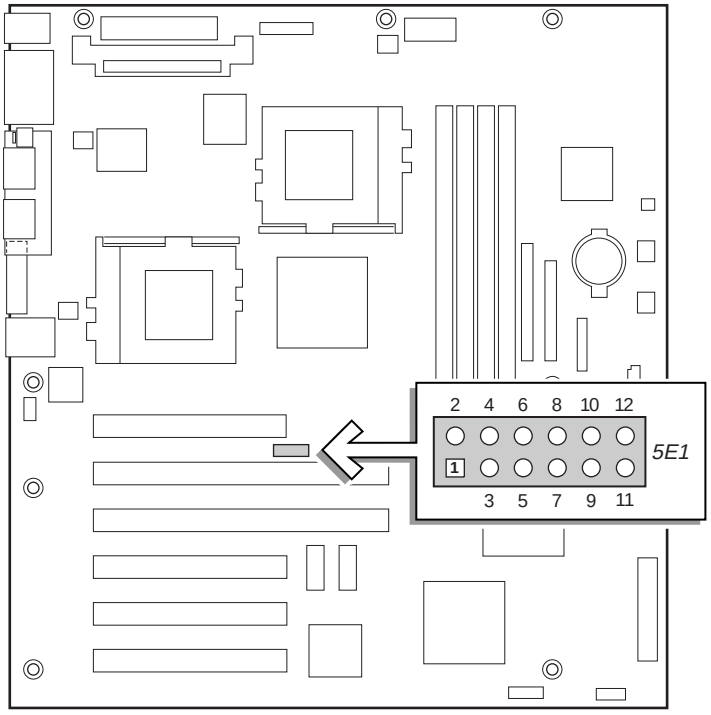


Figure 10. Processor Clock Speed Jumper

Table 3. CPU Clock Speed (5E1)

CPU Speed	Pins 1-2	Pins 3-4	Pins 5-6	Pins 7-8	Pins 9-10	Pins 11-12
667			✓	✓		
733			✓			
800	✓	✓		✓		
867	✓	✓				
933	✓			✓		
1000	✓					

Removing a Processor

1. Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here.
2. Unplug the heatsink fan.
3. Detach the heatsink clip from the processor socket. See the documentation that shipped with your processor for more detail.
4. Remove the heatsink from the processor.
5. Raise the locking bar on the socket.
6. Remove the processor from the socket.
7. If you removed the processor from the secondary socket and are not replacing it, you must install a terminator in its place.

Installing or Removing a Terminator

1. Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here.
2. Raise the locking bar on the socket.
3. Aligning the pins of the processor terminator with the socket, insert the terminator into the socket.
4. Lower the locking bar completely.

Do these steps in reverse to remove the terminator.

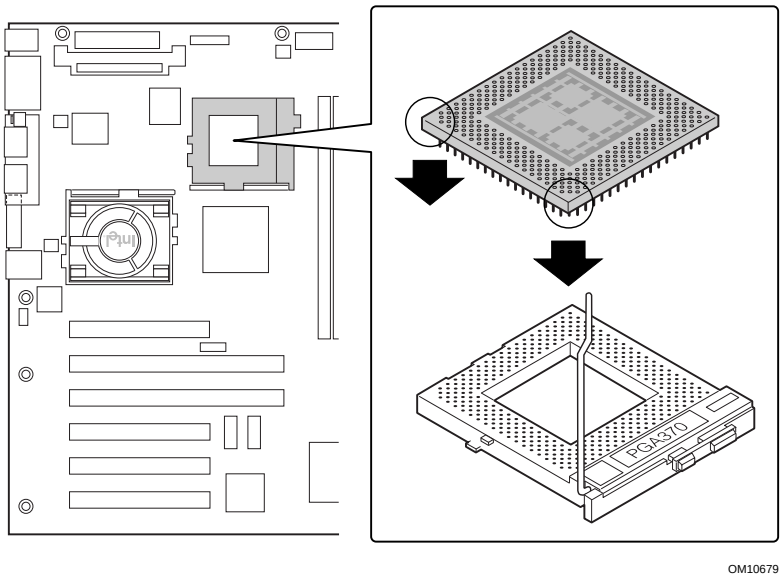


Figure 11. Installing a Terminator

Install the Voltage Regulator Module

If you are installing two processors, you must install a voltage regulator module (VRM).

Orient the VRM as shown and press it into the connector. Make sure the plastic latches engage the VRM.

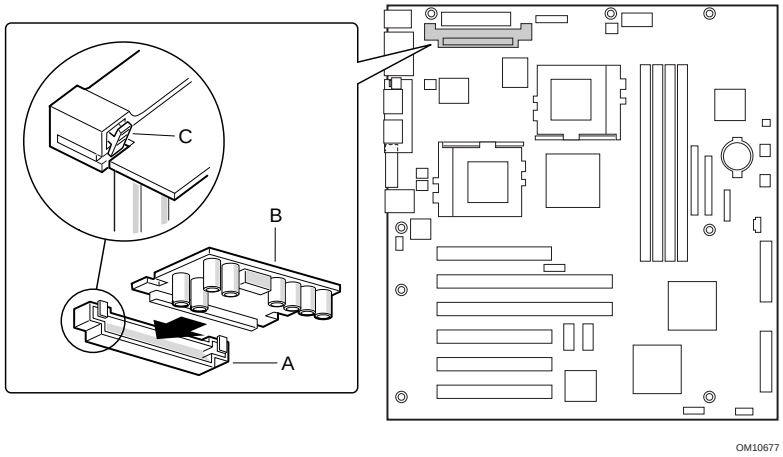


Figure 12. Installing a VRM

Replacing the Back up Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

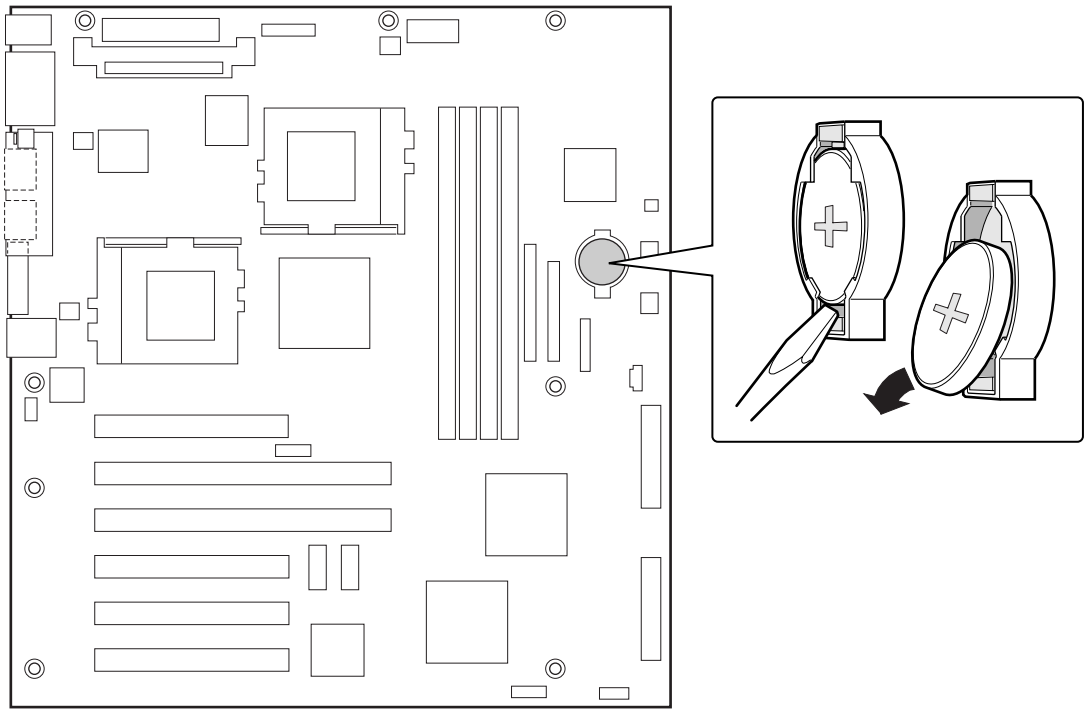
VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Open the chassis.
3. Insert the tip of a small flat bladed screwdriver, or equivalent, under the tab in the plastic retainer. Gently push down on the screwdriver to lift the battery.
4. Remove the battery from its socket.
5. Dispose of the battery according to local ordinance.
6. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.
7. Reinstall the plastic retainer on the lithium battery socket.
8. Close the chassis.
9. Run Setup to restore the configuration settings to the RTC.



OM10678

Figure 13. Replacing the Back up Battery

3 Configuration Software and Utilities

This chapter describes the Power On Self Test (POST) and server configuration utilities. The table below briefly describes the utilities.

Table 4. Configuration Utilities

Utility	Description and brief procedure	Page
BIOS Setup	If the system does not have a diskette drive, or the drive is disabled or misconfigured, use Setup to enable it. Or, you can move the CMOS jumper on the server board from the default setting (Protect CMOS memory) to the Clear setting; this will allow most server configurations to boot. Then run the SSU to configure the server.	33
System Setup Utility (SSU)	Use for viewing and clearing the system event log, viewing the system management FRU information, or viewing the system management SDR repository.	42
FRUSDR Load Utility	Use to update the Field Replacement Unit (FRU), Sensor Data Record (SDR), and SM BIOS (SMB) flash components.	48
BIOS Upgrade Utility	Use to upgrade the BIOS.	53
Firmware Update Utility	Use to update the Firmware.	55
Using the Adaptec SCSI Utility	Use to configure or view the settings of the SCSI host adapters and onboard SCSI devices in the server.	55

Hot Keys

Use the keyboard's numeric pad to enter numbers and symbols.

Table 5. Hot Keys

To do this:	Press these keys
Clear memory and reload the operating system—this is a system reset.	<Ctrl+Alt+Del>
Secure your system immediately.	<Ctrl+Alt>+hotkey (Set your hot key combination with Setup.)

Power-On Self Test (POST)

Each time you turn on the system, POST starts running. POST checks the server board, processor, memory, keyboard, and most installed peripheral devices. During the memory test, POST displays the amount of memory that it is able to access and test. The length of time needed to test memory depends on the amount of memory installed. POST is stored in flash memory.

1. Turn on your video monitor and server. After a few seconds POST begins to run.
2. After the memory test, these screen prompts and messages appear:

   ```
   Press <F2> key if you want to run SETUP
   ```

3. If you do not press <F2> and do NOT have a device with an operating system loaded, the above message remains for a few seconds while the boot process continues, and the system beeps once. Then this message appears:

   ```
   Operating system not found
   ```

   If you do not press <F2> and DO have an operating system loaded, the boot process continues, and this message appears:

   ```
   Press <Ctrl><A> to enter SCSI Utility
   ```

4. Press <Ctrl+A> if there are SCSI devices installed. When the utility opens, follow the displayed instructions to configure the onboard SCSI host adapter settings and to run the SCSI utilities. Also see “Using the Adaptec SCSI Utility” on page 55. If you do not enter the SCSI utility, the boot process continues.
5. Press <Esc> during POST to pop up a boot menu when POST finishes. From this menu you can choose the boot device or enter BIOS Setup.

After POST completes, the system beeps once.

What appears on the screen after this depends on whether you have an operating system loaded and if so, which one.

If the system halts before POST completes running, it emits a beep code indicating a fatal system error that requires immediate attention. If POST can display a message on the video display screen, it causes the speaker to beep twice as the message appears.

Note the screen display and write down the beep code you hear; this information is useful for your service representative. For a listing of beep codes and error messages that POST can generate, see the “Solving Problems” chapter in this manual.

Using BIOS Setup

This section describes the BIOS Setup options. Use Setup to change the server configuration defaults. You can run Setup with or without an operating system being present. Setup stores most of the configuration values in battery backed CMOS; the rest of the values are stored in flash memory. The values take effect when you boot the server. POST uses these values to configure the hardware; if the values and the actual hardware do not agree, POST generates an error message. You must then run Setup to specify the correct configuration.

Record Your Setup Settings

If the default values ever need to be restored (after a CMOS clear, for example), you must run Setup again. Referring to the worksheets could make your task easier.

If You Cannot Access Setup

If the diskette drive is misconfigured so that you cannot access it to run a utility from a diskette, you may need to clear CMOS memory. You will need to open the server, change a jumper setting, use Setup to check and set diskette drive options, and change the jumper back. For a step-by-step procedure, see Chapter 5, under the heading, "CMOS Jumper."

Starting Setup

You can enter and start Setup under several conditions:

- When you turn on the server, after POST completes the memory test
- When you reboot the server by pressing <Ctrl+Alt+Del> while at the DOS operating system prompt
- When you have moved the CMOS jumper on the server board to the "Clear CMOS" position (enabled); for the procedure, see Chapter 5, under the heading "CMOS Jumper"

In the three conditions listed above, after rebooting, you will see this prompt:

```
Press <F2> to enter SETUP
```

NOTE

If the BIOS setup option "POST Diagnostic Screen" is enabled (Default), you will not see the message "Press <F2> to enter SETUP". This message is hidden by the Manufacturer's Splash screen. To see the message, press the <ESC> key while the splash screen is displayed. This will temporarily disable the splash screen allowing you to see the message.

In a fourth condition, when CMOS/NVRAM has been corrupted, you will see other prompts but not the <F2> prompt:

```
Warning:  cmos checksum invalid
Warning:  cmos time and date not set
```

In this condition, the BIOS will load default values for CMOS and attempt to boot.

Setup Menus

To:	Press
Get general help	<F1> or <Alt+H>
Move between menus	← →
Go to the previous item	↑
Go to the next Item	↓
Change the value of an item	+ or -
Select an item or display a submenu	<Enter>
Leave a submenu or exit Setup	<Esc>
Reset to Setup defaults	<F9>
Save and exit Setup	<F10>

When you see this:	What it means
On screen, an option is shown but you cannot select it or move to that field.	You cannot change or configure the option in that menu screen. Either the option is autoconfigured or autodetected, or you must use a different Setup screen.
On screen, the phrase Press Enter appears next to the option.	Press <Enter> to display a submenu that is either a separate full screen menu or a popup menu with one or more choices.

The rest of this section lists the features that display onscreen after you press <F2> to enter Setup. Not all of the option choices are described, because (1) a few are not user selectable but are displayed for your information, and (2) many of the choices are relatively self explanatory.

Main Menu

You can make the following selections on the Main Menu itself. Use the submenus for other selections.

Feature	Choices	Description
System Time	HH:MM:SS	Sets the system time.
System Date	MM/DD/YYYY	Sets the system date.
Diskette A	Disabled **1.44/1.25 MB**	Selects the diskette type.
Diskette B	**Disabled** 1.44/1.25 MB	Selects the diskette type.
Hard Disk Pre-Delay	**Disabled** Enabled	Adds a delay before first access of the hard drive.
Primary Master		Enters submenu.
Primary Slave		Enters submenu.
Processor Speed	N/A	Enters submenu.
Language	**English (US)** Français Deutsch Italiano Español	Selects which language BIOS displays.

Primary Master/Slave Submenu

Feature	Choices	Description
Type	User **Auto** CD ROM ATAPI Removable	User configures the attached drive System detects The attached drive is a CD-ROM The attached drive is a removable media device (tape drive, zip drive)
Multimode Transfers	**Disabled** Enabled	
LBA Mode Control	**Disabled** Enabled	Enables large block addressing
32 Bit I/O	**Disabled** Enabled	
Transfer Mode		Transfer Mode is automatically selected
Ultra DMA Mode		DMA mode is automatically selected

Processor Speed Submenu

Feature	Choices	Description
Processor Speed	N/A	This field is informational only.
Processor #1 type	N/A	This field is informational only.
Cache RAM	N/A	This field is informational only.
Processor #2 type	N/A	This field is informational only.
Cache RAM	N/A	This field is informational only.
Processor #1 Status	N/A	
Processor #2 Status		
Clear Processor Errors	<Enter>	Clears the processor errors.
Processor Error Pause	Disable **Enabled**	Pauses the boot processor on a processor error.
Processor Serial #	Disabled **Enabled**	Enables the processor serial number feature.

Advanced Menu

You can make the following selections on the Advanced Menu itself. Use the submenus for the three other selections that appear on the Advanced Menu.

Feature	Choices	Description
Memory Reconfiguration		Enters submenu.
Peripheral Configuration		Enters submenu.
PCI Device		Enters submenu.
Option ROM		Enters submenu.
Numlock		Enters submenu.
Reset Configuration	Yes **No**	Select Yes if you want to clear the server configuration data during the next boot. The system automatically resets this field to No during the next boot.
Installed O/S	**Other** PNP OS	Select PnP O/S if you are booting a Plug and Play capable operating system.

Memory Reconfiguration Submenu

Feature	Choices	Description
System Memory	N/A	This field is informational only.
Extended Memory	N/A	This field is informational only.
DIMM Group #1 Status	N/A	This field is informational only.
DIMM Group #2 Status	N/A	This field is informational only.
DIMM Group #3 Status	N/A	This field is informational only.
DIMM Group #4 Status	N/A	This field is informational only.
Clear DIMM Error	Press <Enter>	Clears the memory error status.
DIMM Error Pause	**Enabled** Disabled	Enabled causes the system to pause at the end of POST if a memory error occurred.

Peripheral Configuration Submenu

Feature	Choices	Description
Serial Port 1	Disabled 3F8, IRQ 3 **3F8, IRQ 4** 2F8, IRQ 3 2F8, IRQ 4 3E8, IRQ 3 3E8, IRQ 4 2E8, IRQ 3 2E8, IRQ 4 Auto	Auto forces BIOS to configure the port.
Serial Port 2	Disabled 3F8, IRQ 3 3F8, IRQ 4 **2F8, IRQ 3** 2F8, IRQ 4 3E8, IRQ 3 3E8, IRQ 4 2E8, IRQ 3 2E8, IRQ 4 Auto	Auto forces BIOS to configure the port.
Parallel Port	Disabled 398, IRQ 5 **378, IRQ 7** 278, IRQ 5 278, IRQ 7 3BC, IRQ 5 3BC, IRQ 7 Auto	Auto forces BIOS to configure the port.
Parallel Mode	Output only Bi-directional EPP ECP, DMA 1 **ECP, DMA 3**	Selects parallel port mode.
Diskette Controller	Disabled **Enabled**	Enables onboard diskette controller.
Mouse	Disabled Enabled **Auto Detect**	Enables the mouse.
SCSI Controller	Disabled **Enabled**	Enables the onboard SCSI controller.
LAN Controller	Disabled **Enabled**	Enables the onboard LAN controller.
VGA Controller	**Enabled** Disabled	Enables the on board VGA controller.
USB Controller	Disabled **Enabled**	Enables the onboard USB controller.

PCI Device Submenu

Feature	Choices	Description
PCI IRQ 1-14	Disabled **Auto Select** IRQ3 IRQ4 IRQ5 IRQ6 IRQ7 IRQ9 IRQ10 IRQ11 IRQ12	Configure which IRQ resource to allocate for 14 interrupt signal in PCI bus.

Option ROM Submenu

Feature	Choices	Description
On Board SCSI	**Enabled** Disabled	Enables option ROM scan of the onboard SCSI chip. There are 2 SCSI channels that are controlled by the same option ROM.
On Board LAN	**Enabled** Disabled	Enables option ROM scan of the onboard LAN controller.
PCI Slot1-6	**Enabled** Disabled	Enables option ROM scan of the PCI slots.

Numlock Submenu

Feature	Choices	Description
Numlock	**Auto** On Off	Selects the power on state for Num Lock.
Key Click	**Disabled** Enabled	Enables or disables the audible key click.
Keyboard auto-repeat rate	2/sec 6/sec **10/sec** 13.3/sec 18.5/sec 21.8/sec 26.7/sec 30/sec	Sets the numbers of time per second a key will repeat while it is held down.
Keyboard auto-repeat delay	1/4 sec 1/2 sec 3/4 sec **1 sec**	Sets the delay before a key starts to repeat when it is held down.

Security Menu

You can make the following selections on the Security Menu itself. Enabling the Supervisor Password field requires a password for entering Setup. The passwords are not case-sensitive.

Feature	Choices	Description
Supervisor Password is	**Clear** Set	Status only; user cannot modify.
User Password is	**Clear** Set	Status only; user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on server board.
Set Supervisor Password	Press Enter	When the <Enter> key is pressed, you are prompted for a password; press ESC key to abort. Once set, this can be cleared by setting it to a null string, or by clearing password jumper on server board (see Server Board Jumpers in Chapter 5).
Set User Password	Press Enter	When the <Enter> key is pressed, you are prompted for a password; press ESC key to abort. Once set, this can be cleared by setting it to a null string, or by clearing password jumper on server board (see Server Board Jumpers in Chapter 5).
Password on Boot	**Disabled** Enabled	Requires password entry before boot. System will remain in secure mode until password is entered. Password on Boot takes precedence over Secure Mode Boot.
Fixed Disk Boot Sector	**Normal** Write Protect	Protects the boot sector on the boot drive against some viruses.
Diskette Access	**Everyone** Supervisor	Limits the use of the diskette drive to system supervisors. Supervisor password must be set to enable this feature.
Power Switch Mask	**Unmasked** Masked	If set to Masked, you cannot turn off the power using the power switch after rebooting the OS.
Secure Mode		Enters Submenu. This is only available if both the user and supervisor passwords are set.
Option ROM Menu Mask	**Unmasked** Masked	If set to masked, you cannot enter the Adaptec BIOS configuration by pressing CNTL A.

Secure Mode Submenu

Feature	Choices	Description
Secure Mode Timer	**Disabled** 1 min 2 min 5 min 10 min 20 min 1 hr 2 hr	Period of keyboard/PS/2 mouse inactivity specified for secure mode to activate. A password is required for secure mode to function. Cannot be enabled unless at least one password is enabled.
Secure Mode Hot Key	**Disabled** Enabled	Enables Quicklock feature Cannot be enabled unless at least one password is enabled.
Ctrl-Alt-[ ]	[ ] [0-9, A, B, ..., Z]	Key assigned to start the Quicklock feature.
Secure Mode Boot	**Disabled** Enabled	System will boot in secure mode. You must enter a password to unlock the system. Cannot be enabled unless at least one password is enabled.
Floppy Write Protect	**Disabled** Enabled	When secure mode is activated, the diskette drive is write protected. You must enter a password to disable. Cannot be enabled unless at least one password is enabled.

System Hardware Menu

You can make the following selections on the Server Menu itself.

Feature	Choices	Description
Wake On Event		Enters submenu.
AC-LINK	Stay Off **Last State** Power On	Sets what happens when AC power is lost and restored. Stay Off means the server will not power up. Last State means the server will power up if it was powered when AC was lost. Power On means the server will always power up when AC is regained.
Error Log Initialization	Press <Enter> key	Clears the SEL.
Console Redirection		Enters submenu.

Wake on Event Submenu

Feature	Choices	Description
Wake On LAN†	**Disabled** Enabled	Enables remote power on via network command.
Wake On Ring	**Disabled** Enabled	Enables remote power on via serial port.

Console Redirection Submenu

Feature	Choices	Description
COM Port Address	**Disabled** Serial Port 2 (3F8/IRQ4) Serial Port 2 (2F8/IRQ3)	When enabled, console redirection uses the I/O port specified. All keyboard/mouse and video will be directed to this port. This is designed to be used only under DOS in text mode.
Baud Rate	**57.6K** 19.2k	When console redirection is enabled, specifies the baud rate to be used.
Flow Control	No Flow Control **XON/XOFF**	None disallows flow control. XON/XOFF is software-flow control.
Console Connection	**Direct** Via modem	Sets what the console connection is.

Boot Menu

Feature	Device	Description
Boot Diagnostics Screen	**Enabled** Disabled	
Boot Device Priority		Enters submenu.
Hard Drive		Enters submenu.
Removable Devices		Enters submenu.

Boot Device Priority Submenu

Use the up or down arrow keys to select a device; then press the <+> or <-> keys to move the device higher or lower in the boot priority list.

Boot Priority	Device	Description
1.	Diskette Drive	Attempts to boot from the diskette drive.
2.	ATAPI CD-ROM Drive	Attempts to boot from an ATAPI CD-ROM drive.
3.	Hard Drive	Attempts to boot from a hard drive device.
4.	Intel UNDI, PXE-2.0	Attempts to boot from a network connection. Requires the presence of a PXE server.

Hard Drive Submenu

Choices	Description
Hard Drive 1	Autodetected hard drive.
Hard Drive 2	Autodetected hard drive.
Hard Drive 3	Autodetected hard drive.
Bootable Add in Card	Autodetected Add-in card.

Removable Devices

Choices	Description
Diskette A	Autodetected diskette drive.

Exit Menu

You can make the following selections on the Exit Menu. Select an option using the up or down arrow keys; then press <Enter> to execute the option. Pressing <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Choices	Description
Save Changes & Exit	Exits after writing all modified Setup item values to NVRAM.
Exit Without Saving Change	Exits leaving NVRAM unmodified.
Get Default Values	Loads default values for all Setup items.
Load Previous Values	Loads values of all Setup items from previously saved custom defaults.
Save Changes	Writes all Setup item values to NVRAM.

Using the System Setup Utility

The System Setup Utility (SSU) is on the Server Board Resource software CD shipped with the server board. The SSU provides a graphical user interface (GUI) over an extensible framework for server configuration. The SSU framework supports the following functions and capabilities:

- allows viewing and clearing of the system's critical event log
- allows the viewing of the system management FRU information
- allows the viewing of the system management SDR repository

What You Need to Do

The SSU may be run directly from the Server Resource CD (by booting the server system to the CD and selecting "Utilities") or from a set of DOS diskettes.

If you choose to run the SSU from a set of DOS diskettes, you must create the SSU diskettes from the Server Resource CD by booting to the CD and selecting "Create Diskettes." Alternatively, if you have a Windows 95 or Windows NT workstation, you can insert the CD into that system and create diskettes from the "Utilities" menu of the graphical user interface.

If your diskette drive is disabled, or improperly configured, you must use the flash resident Setup utility to enable it so that you can use the SSU. If necessary, you can disable the drive after you exit the SSU. Information entered using the SSU overrides any entered using Setup.

Running the SSU from the CD

Running the ssu.bat file provided on the SSU media starts the SSU. If the server boots directly from the SSU media, the ssu.bat file is automatically run. If it boots from a different media, the SSU can be started manually or by another application. When the SSU starts in the local execution mode (the default mode), the SSU accepts input from the keyboard and/or mouse. The SSU presents a VGA based Graphical User Interface (GUI) on the primary monitor.

The SSU runs from writable, nonwritable, removable, and nonremovable media. If the SSU is run from nonwritable media, user preference settings (such as screen colors) can not be saved.

The SSU supports the ROM-DOS V6.22 operating system. It may run on other ROM-DOS-compatible operating systems but they are not supported. The SSU will not operate from a "DOS box" running under an operating system such as Windows.

Running the SSU Remotely via an Emergency Management Card

Using graphical hardware redirection via the emergency management card 2, you can see the SSU Console in VGA graphics mode, control the mouse, and control the keyboard from a local system connected to a remote server by a network or modem.

The emergency management card 2 provides video memory, keyboard, and mouse redirection support. Video memory and user input are sent to a remote location through either a modem or Ethernet link and displayed by the Remote Control console. This solution requires an emergency management card 2 card installed in the remote server and the Remote Control software available on the local system. The SSU will execute exclusively on the remote server. Any files required for the SSU to execute must be on the remote server.

Starting the SSU

SSU consists of a collection of task oriented modules plugged into a common framework called the Application Framework (AF). The Application Framework provides a launching point for individual tasks and a location for setting customization information. For full functionality the SSU requires the availability of the AF.INI, AF.HLP, plus any .ADN files and their associated .HLP and .INI files.

1. Turn on your video monitor and your system.
2. There are two ways to start the SSU.
   a. **After creating set of three SSU diskettes from the CD:** Insert the first SSU diskette in drive A, and press the reset button or <Ctrl+Alt+Del> to reboot your server from the diskette. Insert the second diskette when prompted.
   b. **Directly from the Server Resource CD:** Insert the Server Resource CD into your CD ROM drive and press the reset button or <Ctrl-Alt-Del> to reboot. When prompted to do so, press <F2> to enter BIOS Setup. From the Boot Menu, select the Boot Device Priority option and then select CD-ROM as your primary boot device. Save those settings and exit BIOS Setup. The server will boot from the CD-ROM and display a menu of options. Follow the instructions in the menu to start the SSU.
3. When the SSU title appears on the screen, press <Enter> to continue.
4. The mouse driver loads if it is available; press <Enter> to continue.
5. This message appears:

   ```
   Please wait while the Application Framework loads....
   ```

6. When the main window of the SSU appears, you can customize the user interface before continuing.

Customizing the SSU

The SSU lets you customize the user interface according to your preferences. The AF sets these preferences and saves them in the AF.INI file so that they take effect the next time you start the SSU. There are four user customizable settings:

- **Color** - this button lets you change the default colors associated with different items on the screen with predefined color combinations. The color changes are instantaneous.
- **Mode** - this button lets you set the desired expertise level.
  - — novice
  - — intermediate
  - — expert

  The expertise level determines which tasks are visible in the Available Tasks section and what actions each task performs. For a new mode setting to take effect, you must exit the SSU and restart it.
- **Language** - this button lets you change the strings in the SSU to strings of the appropriate language. For a new language setting to take effect, you must exit the SSU and restart it.
- **Other** - this button lets you change other miscellaneous options in the SSU. The changes take effect immediately.

To change the interface default values:

Use the mouse to click on the proper button in the Preferences section of the SSU Main window.

or

Use the tab and arrow keys to highlight the desired button, and press the spacebar or <Enter>.

or

Access the menu bar with the mouse or hot keys (Alt + underlined letter).

⟹ NOTE

If you run the SSU from nonwritable media (like a CD-ROM), these preferences will be lost when you exit the SSU.

Launching a Task

It is possible to have many tasks open at the same time, although some tasks may require complete control to avoid possible conflicts. The tasks achieve complete control by keeping the task as the center of operation until you close the task window.

To launch a task:

In the SSU Main window, double-click on the task name under Available Tasks to display the main window for the selected task.

or

Highlight the task name, and click on OK.

or

Use the tab and arrow keys to highlight the desired button, and press the spacebar or <Enter>.

SEL Manager Add-in

Clicking on the SEL Manager Add-in task brings up the Server Event Log (SEL) viewer. You can load and view the current SEL data stored in the BMC, save the currently loaded SEL data to a file, view previously saved SEL data, or clear the SEL.

When the SEL Manager is first invoked, it loads the System Event Log entries from the server. If there are no SEL entries, a message box is displayed.

The SEL Manager main window is based on a multi-column format. All SEL entries are displayed in this window, one system event per row. Each column can be sorted by clicking on the column heading. The event number is tied to the particular event even if any other column sorts the list. The following keyboard keys are used to scroll the event columns. The F4 key shifts the event columns left, while the F5 key shifts the event columns right.

The SEL Manager has the following menus:

File Menu

The File menu has the following options:

- **Open** Open a SEL data file for viewing.
- **Save As…** Save the currently loaded SEL data to a file.
- **Exit** Quits the SEL Viewer.

SEL Menu

The SEL menu has the following options:

- **Properties** Displays information about the SEL. These fields are display only.
- **Clear SEL** Clears the SEL entries from the NV storage area and from the SEL Manager main window.
- **Reload** Reloads the SEL entries from the NV storage area.

Help

The Help menu has the following option:

- **Help Topics** Displays the help information for the SEL Manager Add-in.

SDR Manager Add-in

Clicking on the SDR Manager Add-in task brings up the Sensor Data Record (SDR) viewer. You can load and view the current SDR data stored in the NV storage area, save the currently loaded SDR data to a file, or view previously saved SDR data. The SDR Manager main window provides access to all the features of the add-in through menus. The F4 key shifts the SDR columns left, while the F5 key shifts the SDR columns right.

The SDR Viewer has the following menus:

File Menu

The File menu has the following options:

- **Open** Open a SDR data file for viewing.
- **Save As…** Save the currently loaded SDR data to a file.
- **Exit** Quits the SDR Viewer.

SDR Menu

The SDR menu has the following options:

- **Properties** Displays SDR information from the BMC. These fields are display only.
- **Reload** Reloads the SDR entries from the server.

Help

The Help menu has the following option:

- **Help Topics** Displays the help information for the SDR Manager Add-in.

FRU Manager Add-in

Clicking on the FRU Manager Add-in task brings up the Field Replacement Unit (FRU) viewer. You can load and view the current FRU data stored in the NV storage area, save the currently loaded FRU data to a file, or view previously saved FRU data. The FRU Manager main window provides access to all the features of the add-in through menus. The F4 key shifts the FRU columns left, while the F5 key shifts the FRU columns right.

The FRU Viewer has the following menus:

File Menu

The File menu has the following options:

- **Open** Open a FRU data file for viewing.
- **Save AS…** Save the currently loaded FRU data to a file.
- **Exit** Quits the FRU Viewer.

FRU Menu

The FRU menu has the following options:

- **Properties** Displays FRU information from the BMC. These fields are display only.
- **Reload** Reloads the FRU entries from the server.

Help

The Help menu has the following option:

- **Help Topics** Displays the help information for the FRU Manager Add-in.

Exiting the SSU

Exiting the SSU causes all windows to close.

1. Exit the SSU by opening the menu bar item File in the SSU Main window.
2. Click on Exit.

   or

   Highlight Exit, and press <Enter>.

FRUSDR Load Utility

The Field Replacement Unit (FRU) and Sensor Data Record (SDR) Load Utility is a DOS-based program used to update the server management subsystem's product level FRU, SDR, and the SM BIOS (SMB) nonvolatile storage components (EEPROMs). The load utility

- discovers the product configuration based on instructions in a master configuration file
- displays the FRU information
- updates the nonvolatile storage device (EEPROM) associated with the Baseboard Management Controller (BMC) that holds the SDR and FRU area
- updates the SMB area located in the BIOS nonvolatile storage device
- generically handles FRU devices that may not be associated with the BMC

When to Run the FRUSDR Load Utility

You should run the FRUSDR Load Utility each time you upgrade or replace the hardware in your server, excluding add-in boards, hard drives, and RAM. For example, if you replace an array of fans, you need to run the utility. It programs the sensors that need to be monitored for server management.

Because the firmware must reload to properly initialize the sensors after programming, turn the server off and remove the AC power cords from the server. Wait approximately 30 seconds, and reconnect the power cords.

What You Need to Do

The FRUSDR Load Utility may be run directly from the Configuration Software CD or from a diskette you create from the CD. It can be extracted from the CD by booting to the CD and selecting "Make Diskettes" or by inserting the CD into a PC running Windows 95 or NT and selecting the "Utilities" section.

NOTE

If your diskette drive is disabled, or improperly configured, you must use BIOS Setup to enable it. If necessary, you can disable the drive after you are done with the FRUSDR utility.

How You Use the FRUSDR Load Utility

This utility is compatible with ROM-DOS Ver. 6.22, MS-DOS† Ver. 6.22, and later versions. The utility accepts CFG, SDR and FRU load files. The executable file for the utility is frusdr.exe. The utility requires the following supporting files:

- one or more .fru files describing the system's field replaceable units
- a .cfg file describing the system configuration
- a .sdr file describing the sensors in the system

Command Line Format

The basic command line format is

```
frusdr [/?] [/h] [/d {smb, fru, sdr}] [/cfg filename.cfg] /p
```

Command	Description
frusdr	Is the name of the utility.
/? or /h	Displays usage information.
/d {smb, fru, sdr}	Only displays requested area.
/cfg filename.cfg	Uses custom CFG file.
/p	Pause between blocks of data.

Parsing the Command Line

The FRUSDR Load Utility allows only one command line function at a time. A command line function may consist of two parameters; for example, cfg filename.cfg. Any invalid parameters result in displaying an error message and exiting the program. You can use either a slash (/) or a minus sign (-) to specify command line options. The /p flag may be used in conjunction with any of the other options.

Displaying Usage Information

When the utility is run with the /? or /h command line flags, the following message is displayed:

```
FRU & SDR Load Utility Version X.XX
Usage:   frusdr               Is the name of the utility.
         /? Or /h             Displays usage information.
         /d {smb,fru,sdr}     Only displays requested area.
         /cfg filename.cfg    Uses custom CFG file.
         /p                   Pause between blocks of data.
```

Displaying a Given Area

When the utility is run with the /d SMB, /d FRU, or /d SDR command line flag, the indicated area is displayed. Each area represents a sensor; one sensor for each instrumented device in the server. If the given display function fails because of an inability to parse the data present or a hardware failure, the utility displays an error message and exits.

Displaying SM BIOS Area

The SM BIOS area is displayed in ASCII format when the field is ASCII or as a number when the field is a number. Each SM BIOS area displayed is headed with the SM BIOS area designated name. Each field has a field name header followed by the field in ASCII or as a number.

Displaying FRU Area

The FRU area is displayed in ASCII format when the field is ASCII or as a number when the field is a number. Each FRU area displayed is headed with the FRU area designated name. Each field has a field name header followed by the field in ASCII or as a number. The Board, Chassis, and Product FRU areas end with an END OF FIELDS CODE that indicates there is no more data in this area. The Internal Use area is displayed in hex format, 16 bytes per line.

Displaying SDR Area

The SDR nonvolatile storage area is displayed in the following hex format. The data is separated by a Sensor Record Number X header, where X is the number of that sensor record in the SDR area. The next line after the header is the sensor record data in hex format delineated by spaces. Each line holds up to 16 bytes. The data on each line is followed by the same data in ASCII format; nonprintable characters are substituted by a period (.).

Using Specified CFG File

The utility can be run with the command line parameter of -cfg filename.cfg. The filename can be any DOS accepted, eight-character filename string. The utility loads the specified CFG file and uses the entries in the configuration file to probe the hardware and to select the proper SDRs to load into nonvolatile storage.

Displaying Utility Title and Version

The utility displays its title:

```
FRU & SDR Load Utility, Version X.XX
```

Where X.XX is the revision number for the utility.

Configuration File

The configuration file is in ASCII text. The utility executes commands formed by the strings present in the configuration file. These commands cause the utility to perform various tasks needed to ultimately load the proper SDRs into the nonvolatile storage of the BMC and possibly generic FRU devices. Some of the commands may be interactive and require you to make a choice.

Prompting for Product Level FRU Information

Through the use of a Configuration File, the utility may prompt you for FRU information.

Filtering Sensor Data Record From the SDR File

The MASTER.SDR file has all the possible SDRs for the system. These records may need to be filtered based on the current product configuration. The configuration file directs the filtering of the SDRs.

Updating the SDR Nonvolatile Storage Area

After the utility validates the header area of the supplied SDR file, it updates the SDR repository area. Before programming, the utility clears the SDR repository area. The SDR file is loaded via the .cfg File. Then the utility filters all tagged SDRs depending on the product configuration set in the Configuration File. Nontagged SDRs are automatically programmed. The utility also copies all written SDRs to the SDR.TMP file. It contains an image of what was loaded, and the TMP file is also useful for debugging the server.

Updating FRU Nonvolatile Storage Area

After the configuration is determined, the utility updates the FRU nonvolatile storage area. First it verifies the Common Header area and checksum from the specified FRU file. The Internal Use Area is read out of the specified .FRU file and is programmed into the nonvolatile storage. The Chassis, Board, Product and MultiRecord areas are read out of the specified .FRU file, if they exist, then those areas are programmed into the FRU nonvolatile storage. All the areas are also written to the FRU.TMP file, which is useful for debugging the server.

Updating SMB FRU Nonvolatile Storage Area

After programming the BMC FRU area, the corresponding SMB fields are automatically updated when the server is re-booted.

Cleaning Up and Exiting

If an update was successfully performed, the utility displays an appropriate message and then exits with a DOS exit code of zero.

If the utility fails, it immediately exits with an error message and a non-zero DOS exit code.

Upgrading the BIOS

Preparing for the Upgrade

Before you upgrade the BIOS, prepare for the upgrade by recording the current BIOS settings, obtaining the upgrade utility, and making a copy of the current BIOS.

Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the message:

   ```
   Press <F2> Key if you want to run SETUP
   ```

2. Write down the current settings in the BIOS Setup program.

⟹ NOTE

Do not skip step 2. You will need these settings to configure your computer at the end of the procedure.

Obtaining the Upgrade Utility

You can upgrade to a new version of the BIOS using the new BIOS files and the BIOS upgrade utility, PHLASH.EXE. You can obtain the BIOS upgrade file and the PHLASH.EXE utility through your computer supplier or from the Intel Customer Support website:

http://support.intel.com/support/motherboards/server/STL2

⟹ NOTE

Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.

This upgrade utility allows you to:

- Upgrade the BIOS in flash memory.
- Update the language section of the BIOS.

The following steps explain how to upgrade the BIOS.

Creating a Bootable Floppy Diskette

1. Use a DOS or Windows 95 system to create the floppy disk.
2. Insert a floppy disk in floppy drive A.
3. At the C:\ prompt, for an unformatted floppy disk, type:

   ```
   format a:/s
   ```

   or, for a formatted floppy disk, type:

   ```
   sys a:
   ```

4. Press <Enter>

Creating the BIOS Upgrade Floppy Diskette

The BIOS upgrade file is a compressed self-extracting archive that contains the files you need to upgrade the BIOS.

1. Copy the BIOS upgrade file to a temporary directory on your hard disk.
2. From the C:\ prompt, change to the temporary directory.
3. To extract the file, type the name of the BIOS upgrade file, for example:

   ```
   10006BI1.EXE
   ```
4. Press <Enter>. The extracted file contains the following files:

   LICENSE.TXT

   README.TXT

   BIOS.EXE
5. Read the LICENSE.TXT file, which contains the software license agreement and the README.TXT file, which contains the instructions for the BIOS upgrade.
6. Insert the bootable floppy disk into drive A.
7. To extract the BIOS.EXE file to the floppy disk, change to the temporary directory that holds the BIOS.EXE file and type:

   ```
   BIOS A:
   ```
8. Press <Enter>.
9. The floppy disk now holds the BIOS upgrade and recovery files.

Upgrading the BIOS

1. Boot the computer with the floppy disk in drive A. The BIOS upgrade utility screen appears.
2. When you are prompted to reboot the server, remove the floppy disk and reboot.
3. As the computer boots, check the BIOS identifier (version number) to make sure the upgrade was successful.
4. To enter the Setup program, press <F2> when you see the message:

   ```
   Press <F2> Key if you want to run SETUP
   ```
5. For proper operation, load the Setup program defaults.
6. Set the options in the Setup program to the settings you wrote down before the BIOS upgrade.
7. Save the settings and exit.

Recovering the BIOS

It is unlikely that anything will interrupt the BIOS upgrade; however, if an interruption occurs, the BIOS could be damaged. The following steps explain how to recover the BIOS if an upgrade fails. The following procedure use recovery mode for the Setup program.

NOTE

Because of the small amount of code available in the nonerasable boot block area, there is no video support. You will not see anything on the screen during the procedure. Monitor the procedure by listening to the speaker and looking at the floppy drive LED.

1. Turn off all peripheral devices connected to the computer. Turn off the computer.
2. Remove the computer cover.
3. Locate jumper block 3N7.
4. Jumper pins 9-10 (see Figure 14 on page 65).
5. Insert the bootable BIOS upgrade floppy disk into floppy drive A.
6. Replace the cover, turn on the computer, and allow it to boot. The recovery process will take a few minutes.
7. Listen to the speaker.
8. Two beeps and the end of activity in drive A indicate successful BIOS recovery.
9. A series of continuous beeps indicates failed BIOS recovery.
10. If recovery fails, return to step 1 and repeat the recovery process.
11. If recovery is successful, turn off the computer. Remove the computer cover and continue with the following steps.
12. Remove the jumper from pins 9-10.
13. Replace the computer cover. Leave the upgrade disk in drive A and turn on the computer.
14. Continue with the BIOS upgrade (see page 53).

Changing the BIOS Language

You can use the BIOS upgrade utility to change the language the BIOS uses for messages and the Setup program. Use a bootable floppy disk containing the Intel flash utility and language files.

1. Boot the computer with the bootable floppy disk in drive A. The BIOS upgrade utility screen appears.
2. Select `Update Flash Memory From a File`.
3. Select `Update Language Set`. Press <Enter>.
4. Select drive A and use the arrow keys to select the correct `.lng` file. Press <Enter>.
5. When the utility asks for confirmation that you want to flash the new language into memory, select `Continue with Programming`. Press <Enter>.
6. When the utility displays the message `upgrade is complete`, remove the floppy disk. Press <Enter>.
7. The computer will reboot and the changes will take effect.

Using the Firmware Update Utility

The Firmware Update Utility is a DOS-based program used to update the Baseboard Management Controller's firmware code. You only need to run the Firmware Update Utility if new firmware code becomes necessary.

Running the Firmware Update Utility

1. Create a DOS bootable diskette. The version of DOS must be 6.0 or higher.
2. Copy the file ANSI.SYS to the diskette. Without this file, the procedure will run correctly, but the screen will not be readable.
3. Expand the file (for example, STL2FWSDR.ZIP) to the diskette.
4. Insert the diskette into the drive and boot to it. The utility will run automatically.
5. Shut the system down and remove any floppy disks that may be in the system.
6. Disconnect the AC power cord from the system and wait 60 seconds.
7. Connect the AC power cord and power up the system.

Using the Adaptec SCSI Utility

The Adaptec SCSI utility detects the SCSI host adapters on the server board. The utility runs out of BIOS and is used to

- Change default values
- Check and/or change SCSI device settings that may conflict with those of other devices in the server

Running the SCSI Utility

1. When this message appears on the video monitor:

   ```
   Press Ctrl-A to run SCSI Utility...
   ```

2. Press <Ctrl+A> to run this utility. When it appears, choose the host adapter that you want to configure.

Another Adaptec utility that is available on the STL2 Resource CD is the Adaptec EZ SCSI utility. It is designed to be installed from diskettes on to a DOS or Windows operating system.

4 Solving Problems

This chapter helps you identify and solve problems that might occur while you are using the system.

Resetting the System

To do this:	Press:
Soft boot reset, which clears system memory and reloads the operating system.	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system.	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals.	Power off/on

Initial System Startup

Problems that occur at initial system startup are usually caused by incorrect installation or configuration. Hardware failure is a less frequent cause.

Checklist

- ❑ Are the power supplies turned on? Check the switches on the back of the chassis.
- ❑ Are all cables correctly connected and secured?
- ❑ Are the processors or processor termination board fully seated in their slots on the server board?
- ❑ Are all add-in PCI boards fully seated in their slots on the server board?
- ❑ Are all jumper settings on the server board correct?
- ❑ Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts—for example, two add-in boards sharing the same interrupt.
- ❑ Are all DIMMs installed correctly?
- ❑ Are all peripheral devices installed correctly?
- ❑ If the system has a hard disk drive, is it properly formatted or configured?
- ❑ Are all device drivers properly installed?
- ❑ Are the configuration settings made in Setup correct?
- ❑ Is the operating system properly loaded? Refer to the operating system documentation.
- ❑ Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
- ❑ Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V~ or a NEMA 6-15R outlet for 200-240 V~?
- ❑ Is AC power available at the wall outlet?
- ❑ Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list on the Intel Customer Support website.

Running New Application Software

Problems that occur when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly.

Checklist

- ❑ Does the system meet the minimum hardware requirements for the software? See the software documentation.
- ❑ Is the software an authorized copy? If not, get one; unauthorized copies often do not work.
- ❑ If you are running the software from a diskette, is it a good copy?
- ❑ If you are running the software from a CD-ROM disk, is the disk scratched or dirty?
- ❑ If you are running the software from a hard disk drive, is the software correctly installed? Were all necessary procedures followed and files installed?
- ❑ Are the correct device drivers installed?
- ❑ Is the software correctly configured for the system?
- ❑ Are you using the software correctly?

If the problems persist, contact the software vendor's customer service representative.

After the System Has Been Running Correctly

Problems that occur after the system hardware and software have been running correctly often indicate equipment failure. Many situations that are easy to correct, however, can also cause such problems.

Checklist

- ❑ If you are running the software from a diskette, try a new copy of the software.
- ❑ If you are running the software from a CD-ROM disk, try a different disk to see if the problem occurs on all disks.
- ❑ If you are running the software from a hard disk drive, try running it from a diskette. If the software runs correctly, there may be a problem with the copy on the hard disk drive. Reinstall the software on the hard disk, and try running it again. Make sure all necessary files are installed.
- ❑ If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- ❑ If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. (Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.)

NOTE

Random errors in data files: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.

More Problem Solving Procedures

This section provides a more detailed approach to identifying a problem and locating its source.

Preparing the System for Diagnostic Testing

⚠ CAUTION

Turn off devices before disconnecting cables: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect all of them from the system, except the keyboard and video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A. Otherwise, place a diskette containing the operating system files in drive A.
5. Turn on the system. If the power LED does not light, see "Power Light Does Not Light" on page 60.

Monitoring POST

See Chapter 3.

Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- ❑ Does the diskette drive activity light turn on briefly? If not, see "Diskette Drive Activity Light Does Not Light" on page 62.
- ❑ If a second diskette drive is installed, does its activity light turn on briefly? If not, see "Diskette Drive Activity Light Does Not Light" on page 62.

Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see "Initial System Startup" on page 57.

Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.
- There is no beep or an incorrect beep pattern.
- No characters appear on screen.
- Characters on the screen appear distorted or incorrect.
- System cooling fans do not rotate.
- Diskette drive activity light does not light.
- CD-ROM drive activity light does not light.
- There are problems with application software.
- The bootable CD-ROM is not detected.

Try the solutions in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

Power Light Does Not Light

Check the following:

- ❑ Is the system operating normally? If so, the power LED is probably defective or the cable from the front panel to the server board is loose.
- ❑ Are there other problems with the system? If so, check the items listed under "System Cooling Fans Do Not Rotate Properly."

If all items are correct and problems persist, contact your service representative or authorized dealer for help.

No Characters Appear on Screen

Check the following:

- ❑ Is the keyboard functioning? Check to see that the "Num Lock" light is functioning.
- ❑ Is the video monitor plugged in and turned on?
- ❑ Are the brightness and contrast controls on the video monitor properly adjusted?
- ❑ Are the video monitor switch settings correct?
- ❑ Is the video monitor signal cable properly installed?
- ❑ Is the onboard video controller enabled?

If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in the server board connector.
2. Reboot the system for changes to take effect.
3. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.
4. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

Characters Are Distorted or Incorrect

Check the following:

- ❑ Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer's documentation.
- ❑ Are the video monitor signal and power cables properly installed?

If the problem persists, the video monitor may be faulty or it may be the incorrect type. Contact your service representative or authorized dealer for help.

System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, system components could be damaged.

Check the following:

- ❑ Is AC power available at the wall outlet?
- ❑ Is the system power cord properly connected to the system and the wall outlet?
- ❑ Did you press the power button?
- ❑ Is the power on light lit?
- ❑ Have any of the fan motors stopped (use the server management subsystem to check the fan status)?
- ❑ Are the fan power connectors properly connected to the server board?
- ❑ Is the cable from the front panel board connected to the server board?
- ❑ Are the power supply cables properly connected to the server board?
- ❑ Are there any shorted wires caused by pinched cables or power connector plugs forced into power connector sockets the wrong way?

If the switches and connections are correct and AC power is available at the wall outlet, contact your service representative or authorized dealer for help.

Diskette Drive Activity Light Does Not Light

Check the following:

- ❑ Are the diskette drive power and signal cables properly installed?
- ❑ Are all relevant switches and jumpers on the diskette drive set correctly?
- ❑ Is the diskette drive properly configured?
- ❑ Is the diskette drive activity light always on? If so, the signal cable may be plugged in incorrectly.

If you are using the onboard diskette controller, use the Setup Utility to make sure that "Onboard Floppy" is set to "Enabled." If you are using an add-in diskette controller, make sure that "Onboard Floppy" is set to "Disabled."

If the problem persists, there may be a problem with the diskette drive, server board, or drive signal cable. Contact your service representative or authorized dealer for help.

Hard Disk Drive Activity Light Does Not Light

The hard disk drive activity light is not connected to the STL2 server board.

CD-ROM Drive Activity Light Does Not Light

Check the following:

- ❑ Are the power and signal cables to the CD-ROM drive properly installed?
- ❑ Are all relevant switches and jumpers on the drive set correctly?
- ❑ Is the drive properly configured?
- ❑ Is the onboard IDE controller enabled?

Cannot Connect to a Server

- ❑ Make sure you are using the drivers that are shipped on the system Configuration Software CD for the onboard network controller.
- ❑ Make sure the driver is loaded and the protocols are bound.
- ❑ Make sure the network cable is securely attached to the connector at the system back panel. If the cable is attached but the problem persists, try a different cable.
- ❑ Make sure the hub port is configured for the same duplex mode as the network controller.
- ❑ Check with your LAN administrator about the correct networking software that needs to be installed.
- ❑ If you are directly connecting two servers (no hub), you will need a crossover cable (see your hub documentation for more information on crossover cables).
- ❑ Check the network controller LEDs that are visible through an opening at the system back panel.

Problems with Network

The server hangs when the drivers are loaded.

- ❑ Change the PCI BIOS interrupt settings. Try the "PCI Installation Tips" below.

Diagnostics pass, but the connection fails.

- ❑ Make sure the network cable is securely attached.
- ❑ Make sure you specify the correct frame type in your NET.CFG file.

The Activity LED doesn't light.

The network activity light is not connected to the STL2 server board.

The controller stopped working when an add-in adapter was installed.

- ❑ Make sure the cable is connected to the port from the onboard network controller.
- ❑ Make sure your PCI BIOS is current. Try the "PCI Installation Tips" below.
- ❑ Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts; OS/2† does not.
- ❑ Try reseating the add in adapter.

The add-in adapter stopped working without apparent cause.

- ❑ Try reseating the adapter first; then try a different slot if necessary.
- ❑ The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- ❑ Run the diagnostics.

PCI Installation Tips

Some common PCI tips are listed here.

- ❑ Reserve interrupts (IRQs) and/or memory addresses specifically for ISA adapters. This prevents PCI cards from trying to use the same settings ISA cards are using. Use the SSU to keep track of ISA adapter resources.
- ❑ Certain drivers may require interrupts that are not shared with other PCI drivers. The SSU can be used to adjust the interrupt numbers for PCI devices. For certain drivers, it may be necessary to alter settings so that interrupts are not shared.

Problems with Application Software

If you have problems with application software, do the following:

- ❑ Verify that the software is properly configured for the system. See the software installation and operation documentation for instructions on setting up and using the software.
- ❑ Try a different copy of the software to see if the problem is with the copy you are using.
- ❑ Make sure all cables are installed correctly.
- ❑ Verify that the server board jumpers are set correctly. See Chapter 5.
- ❑ If other software runs correctly on the system, contact your vendor about the failing software.

If the problem persists, contact the software vendor's customer service representative for help.

Bootable CD-ROM Is Not Detected

Check the following:

- ❑ Is the BIOS set to allow the CD-ROM to be the first bootable device?

5 Technical Reference

Server Board Jumpers

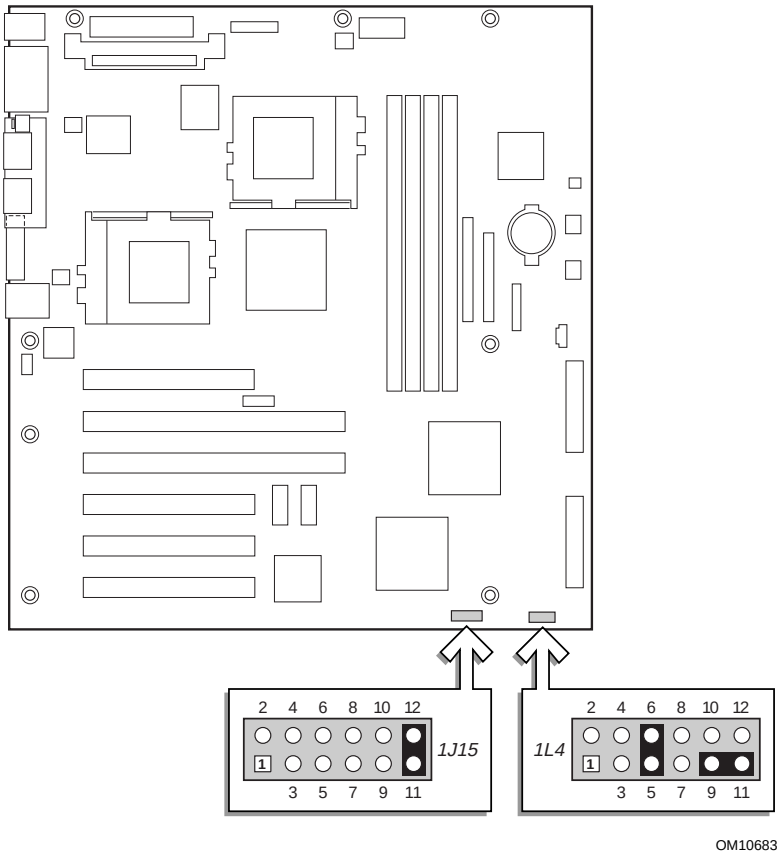


Figure 14. Jumper Locations

Table 6. Configuration Jumper (1J15)

Jumper Name	Pins	What it does at system reset
CMOS clear	1-2	If these pins are jumpered, the CMOS settings will be cleared on the next reset. These pins should **not** be jumpered for normal operation.
Password Disable	3-4	If these pins are jumpered, the password will be cleared on the next reset. These pins should **not** be jumpered for normal operation.
Reserved	5-6	Reserved. These pins should **not** be jumpered for normal operation.
Reserved	7-8	Reserved. These pins should **not** be jumpered for normal operation.
Reserved	9-10	If these pins are jumpered, the system will attempt BIOS recovery. These pins should **not** be jumpered for normal operation.
Reserved	11-12	Reserved. These pins **should** be jumpered for normal operation.

Table 7. Configuration Jumper (1L4)

Jumper Name	Pins	What it does at system reset
FRB 3	1-2	If these pins are jumpered, FRB is disabled.
Front Cover Chassis Intrusion Sensor	3-4	This is an alternate connector for the chassis intrusion switch. The preferred connector is pins 1-2 on block 6A.
Reserved	5-6	Reserved. These pins **should** be jumpered.
Reserved	7-8	Reserved. These pins should **not** be jumpered.
Reserved	9-10	Reserved. These pins should **not** be jumpered.
Reserved	11-12	Reserved. These pins should **not** be jumpered.

6 Regulatory and Integration Information

Product Regulatory Compliance

Product Safety Compliance

The SBT2 complies with the following safety requirements:

- UL 1950 - CSA 950 (US/Canada)
- EN 60 950 (European Union)
- IEC60 950 (International)
- CE – Low Voltage Directive (73/23/EEC) (European Union)
- EMKO-TSE (74-SEC) 207/94 (Nordics)

Product EMC Compliance

The SBL2 has been has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel host system. For information on compatible host system(s) refer to Intel's Server Builder website or contact your local Intel representative.

- FCC (Class A Verification) – Radiated & Conducted Emissions (USA)
- ICES-003 (Class A) – Radiated & Conducted Emissions (Canada)
- CISPR 22 (Class A) – Radiated & Conducted Emissions (International)
- EN55022 (Class A) – Radiated & Conducted Emissions (European Union)
- EN55024 (Immunity) (European Union)
- EN61000-3-2 & -3 (Power Harmonics & Fluctuation and Flicker)
- CE – EMC Directive (89/336/EEC) (European Union)
- VCCI (Class A) – Radiated & Conducted Emissions (Japan)
- AS/NZS 3548 (Class A) – Radiated & Conducted Emissions (Australia / New Zealand)
- RRL (Class A) Radiated & Conducted Emissions (Korea)
- BSMI (Class A) Radiated & Conducted Emissions (Taiwan)

Product Regulatory Compliance Markings

This product is provided with the following Product Certification Markings.

- cURus Recognition Mark
- CE Mark
- Russian GOST Mark
- Australian C-Tick Mark
- Taiwan BSMI Certification Number 3892I921 and BSMI EMC Warning

Electromagnetic Compatibility Notices

USA / FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124
1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

BSMI (Taiwan)

The BSMI Certification number 3892I921 is silk screened on the component side of the server board; and the following BSMI EMC warning is located on solder side of the server board.

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Replacing the Back up Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

7 Equipment Log and Power Consumption Worksheets

Equipment Log

Use the blank equipment log provided here to record information about your system. You will need some of this information when you run the SSU.

Item	Manufacturer Name and Model Number	Serial Number	Date Installed
System			
Server board			
Primary Processor speed and cache			
Secondary Processor speed and cache			
Video display			
Keyboard			
Mouse			
Diskette drive A			
Diskette drive B			
Tape drive			
CD-ROM drive			
Hard disk drive 1			
Hard disk drive 2			
Hard disk drive 3			
Hard disk drive 4			
Hard disk drive 5			

continued

Equipment Log (continued)

Item	Manufacturer Name and Model Number	Serial Number	Date Installed

Current Usage

NOTE

Both processors pull power from +5V. This may limit the number of drives and/or add-in cards you may install.

As an overall current usage limitation on the power supply, do not exceed a combined power output of 195 watts for the +5 and +3.3 volt outputs.

The PCI slots on the server board are rated at a maximum of 5 amperes per slot. The maximum power allowed for each slot is 20 watts at +5 volts. The average current usage per slot should not exceed 3.0 amperes per slot; that is, 15 watts.

The cooling efficiency varies per slot; therefore, ensure that adequate cooling is available in the target slot—especially in an expansion slot drawing more than 2.0 amperes.

Calculating Power Consumption

The total combined wattage for the system configuration must be less than the output of your power supply. Use the two worksheets in this section to calculate the power used by your server boards. For current and voltage requirements of add-in boards and peripherals, see your vendor documents.

Worksheet, Calculating DC Power Usage

1. List the current for each board and device in the appropriate voltage level column.
2. Add the currents in each column. Then go to the next worksheet.

Table 8. Power Usage Worksheet 1

	Current (maximum) at voltage level:				
Device	**+3.3 V**	**+5 V**	**5 V Standby**	**+12 V**	**–12 V**
Server board	46 A	12.5 A	.18 A	.006A	
Primary Processor (866MHz/256MB)		4.78 A			
Secondary Processor (866MHz/256MB)		4.78 A			
Terminator, if no second processor					
Memory (four 64 MB DIMMs)	5.5 A				
PCI slot 1		2.0 A	.1 A		
PCI slot 2	3.03 A		.1 A		
PCI slot 3	3.03 A		.1 A		
PCI slot 4		2.0 A	.1 A		
PCI slot 5		2.0 A	.1 A		
PCI slot 6		2.0 A	.1 A		
PCI slot 7		2.0 A	.1 A		
1st 3.5-inch hard disk drive					
2nd 3.5-inch hard disk drive					
3rd 3.5-inch hard disk drive					
4th 3.5-inch hard disk drive					
5th 3.5-inch hard disk drive					
6th 3.5-inch hard disk drive					
7th 3.5-inch hard disk drive					
3.5-inch diskette drive					
CD-ROM drive					
Fans (3 chassis and 2 processor)				1.32 A	
Total Current					

Worksheet, Total Combined Power Used by the System

1. From the previous worksheet, enter the total current for each column.
2. Multiply the voltage by the total current to get the total wattage for each voltage level.
3. Add the total wattage for each voltage level to arrive at a total combined power usage on the power supply.

Table 9. Power Usage Worksheet 2

Voltage level and total current (V X A = W)	**Total Watts for each voltage level**
(+3.3 V) X (_____ A)	_____ W
(+5 V) X (_____ A)	_____ W
(–5 V) X (_____ A)	_____ W
(+12 V) X (_____ A)	_____ W
(–12 V) X (_____ A)	_____ W
Total Combined Wattage	_____ W

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